

The Effect of Job-Related English Learning Materials for Mobile Learning Implementation on Students' English Mastery

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Abstract—This study aims to test the effectiveness of the Job-Related English Learning Material (JRELM) for Mobile Learning Implementation for teaching English at Bali State Polytechnic, Indonesia. Regarding English language aspects and skills, JRELM includes grammar, vocabulary, reading, speaking, listening, and writing materials. This study was conducted by following the pre-test and post-test control group design. This study involved 48 students; 24 were in the experimental group, and the other 24 were in the control group. They were the 2nd-semester students of the electrical engineering study program at the Bali State Polytechnic. To collect the study data, the researchers used pre-test and post-tests to measure the students' English mastery. Validity and reliability tests were conducted to ensure the pre-test and post-test were valid and reliable before being used to collect the study data. The researchers used the results of the pre-test and post-test of the experimental group and control group to get the N-gain scores. Then, the N-gained scores were further analyzed quantitatively using descriptive statistics and an independent sample t-test to identify the effectiveness of JRELM on students' English mastery. The data results show that the JRELM for mobile learning significantly affects students' English mastery. It is because the JRELM can be accessed at any time, it is provided with exciting learning materials, and it helps students focus on learning with relevant material according to the professional field. Thus, this study concluded that JRELM effectively improves students' mastery of English.

Index Terms—learning material, English electrical, student's needs, model development

I. INTRODUCTION

Polytechnics are higher education institutions with the authority to provide vocational education in various scientific and technological disciplines, producing graduates who are ready to work and have applied skills up to the bachelor's level (Kemdikbud, 2014). Bali State Polytechnic (hereinafter BSP) is one of the vocational education institutions in Bali. It offers 60% to 70% practices and 40% to 30% theories of various vocations. Learnings center practical industrial demands for national, regional, and international markets. BSP's mission is to become a quality vocational higher education institution that produces internationally competitive professional graduates by 2025. To achieve this vision, BSP strives to implement a quality learning process to produce reliable personnel who meet market demands in engineering, trade, and tourism.

Besides, BSP also wants to establish sustainable collaboration with educational institutions, government institutions, businesses, professional associations, and the public nationally and internationally. Thus, in the BSP curriculum, English is considered a crucial subject. However, to meet the objective of BSP, the English subject in the BSP curriculum can be classified as English for occupational purposes (EOP). Chauvin et al. (2020) explain that EOP focuses on improving English language skills related to the students' targeted jobs. Moreover, Kamil and Muhammad (2021) added that EOP should ensure that the students can communicate in English to do the jobs that the students target in the future. Therefore, the instruction, especially the learning materials, should meet the student's needs.

Referring to the vision of the BSP as an institution that produces professional workers that suit the industries' needs in engineering, commerce, and tourism as the foundation and direction of development, a curriculum that refers to

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industrial needs is an absolute necessity. Therefore, the curriculum implementation must continuously be monitored and adapted to the development of the need for English in the industry, which absorbs BSP graduates for all majors and study programs.

Some previous studies have been done in the EOP field. Masadeh and Alahmed (2016), in their study, have identified the students' needs at Najran University. They used two questionnaires to collect the data they needed, one for collecting data from the faculty members and another to collecting the data from the students. Their study found that to meet the student's needs, the learning materials should provide them with reading and writing exercises related to faxes and emails, information sources, office communication, report writing, tactful language, and various business letters. Rautenbach et al. (2018) conducted a study to develop English language materials to meet the students' needs in technology universities. From the studies conducted, it was found that universities in the technology sector aim to produce graduates who suit the company's needs so that they can quickly get suitable jobs. Seeing the status of English as a globally accepted lingua franca, more and more people are interested in studying EOP to obtain wider job opportunities. In other words, a needs analysis is crucial to organize an appropriate EOP according to student needs. In order to obtain valid and reliable data, the needs analysis method must be correct. For this reason, Rautenbach et al. (2018) analyzed existing needs analysis methodologies by involving stakeholders to review these methodologies to develop an EOP curriculum for Tourism Management at the South African University of Technology.

Quality learning materials support the teaching and learning (Kobayashi, 2023). Learning materials are the students' sources of learning and essential tools to help teachers conduct effective instruction (Kosanke, 2019; Yusrina et al., 2021). From class observations and confirmation from English teaching lecturers, students often have difficulty learning ESP because it should provide students with more specific learning and assignments and competency in English based on their field (Klimova, 2015; Medrea & Rus, 2012). One of the problems in the ESP class is the obstacle of providing lessons according to the competence and field of the course. This happens because ESP is concerned about the needs of students in terms of their work or specialization background (Basturkmen, 2010).

Furthermore, ESP is different from general English because, in ESP, the teachers need to teach specific English and knowledge to the students (Suryadi, 2021). However, appropriate and quality learning materials for ESP are not always available. The lecturers in the BSP Electrical Engineering Study Program also faced the absence of quality and appropriate English learning materials for EOP. Therefore, the solution to that problem is developing learning materials appropriate to the student's needs so that the learning material can support the objective of English subjects in the study program.

Regarding language learning materials, Job Related English Learning Material (hereinafter JRELM) for EOP was designed and developed to give and utilize information and provide experience using the target language. The JRELM was designed to promote language learning by adopting Tomlinson's (2012) six basic principles. First, good language learning materials will make students interested in learning and positively impact their learning achievement. Second, good learning materials will make students comfortable learning and using the target language. Third, good learning materials will make students confident using the target language. Fourth, learning materials must be appropriate to students' needs and useful for their daily lives. Fifth, good learning materials provide various learning activities for students to learn according to their learning style. Sixth, learning materials provide material on topics that are appropriate and understood by students. The learning material should be related to students' interests and needs. Regarding English aspects and skills, the JRELM for EOP was designed and developed to include teaching materials for teaching grammar and vocabulary and developing listening, speaking, reading, and writing skills.

The JRELM was developed to meet the students' English communication needs in the electrical engineering field. Therefore, the learning materials were designed based on the topics generally discussed in electrical engineering. The importance of providing the students with learning materials that meet their needs includes the learning materials will encourage the students to love the learning materials, make deeper connections to learning, make the students learn English language and electrical engineering at the same time, make the students experience knowledge in a larger context; provide the students with authentic materials, make the learning process more student-centered; help the English teachers to specify the language skills that they should cover; and align the learning materials with current popular instructional models. JRELM entails linking written texts to spoken skills. Designing JRELM units of lessons that focus on developing language skills in electrical engineering implies guided practice as they develop language skills for meaningful communication through whole texts (Cutting et al., 2002). JRELM can potentially improve students' English skills because students are allowed to communicate in English during the learning process and when completing assignments. Through this learning process, students will become more productive and try to connect new information obtained with previous knowledge (Kucherenko, 2013).

The present study aims explicitly to identify the effectiveness of JRELM. This is because even though JRELM has been proven to meet the student's needs, it has not been proven empirically to be an effective learning material to improve students' mastery of English. Therefore, the study aims to identify the effect of the JRELM on electrical engineering students' English mastery.

II. METHOD

Since the study's objective is to identify the effectiveness of the JRELM on students' English mastery, this study was conducted by following a quasi-experimental method. Specifically, this study followed the pre-test and post-test control group design. This study was conducted at BSP, and the study population was all the electrical engineering students at BSP. Forty-eight students from two different classes were involved as the study's samples. One class with 24 students was assigned as the experimental group, and another with 24 students was selected as the control group. The experimental group was taught using the JRELM, while the control group was taught using the conventional learning materials.

The two groups were given English mastery tests through pre-test and post-test. Before the researchers used the tests, the pre-test and post-test were evaluated to check their validity and reliability. When the tests have been proven to be valid and reliable, then those tests were used to measure students' English mastery. The pre-test was given to the experimental and control groups before the experimental group was taught using JRELM. On the other hand, the post-test was given after the experimental group had been taught using JRELM, and the control group was taught using conventional learning materials for ten sessions. The pre-test and post-test results were transformed into N-gain scores. Then, those N-gain scores were analyzed quantitatively using descriptive and inferential statistics using an independent sample t-test. The researcher used SPSS version 20 for Windows to do the statistical analysis. Furthermore, the researchers also measured the effect size of the JRELM using Cohen's d formula.

III. FINDING

This section explains the results of the study. This section starts with an explanation of the results of the pre-test and post-test by comparing the descriptive statistics results of the N-gain scores of the experimental and control groups. Then, it follows the N-gain scores' normality and homogeneity test results. After that, the results of the independent sample t-test are discussed. Finally, this section also provides the effect size of the JRELM on students' English mastery.

A. Descriptive Statistics Results

The pre-test and post-test results of the experimental and control groups were transformed into N-gain scores. Then, the N-gain scores of the experimental and the control groups were analyzed using descriptive statistics analysis. The results of the descriptive statistics analysis can be seen in Table 1 below. Table 1 shows that the experimental group has higher N-gain scores than the control group. The differences can be seen from the two groups' mean, minimum, and maximum scores. Those scores indicate that the experimental group has better English mastery than the control group. However, an inferential statistics analysis is needed to determine the difference between the experimental and control groups' English mastery. Therefore, the researchers continued the analysis using an independent samples t-test. Before the researchers did the inferential statistics analysis, they did normality and homogeneity tests to decide the proper inferential statistic to analyze the data.

TABLE 1
THE DESCRIPTIVE STATISTICS RESULTS OF THE N-GAIN SCORES

Statistics	Experimental	Control
Mean	28.5417	17.2083
Median	26.5000	17.0000
Mode	25.00	17.00 ^a
Std. Deviation	8.32481	4.33368
Variance	69.303	18.781
Range	38.00	18.00
Minimum	12.00	8.00
Maximum	50.00	26.00
Sum	685.00	413.00

B. Normality Test Result

The study data should be normally distributed to analyze the data using independent samples t-test. Since the number of samples in this study was less than 100, the researchers used the Shapiro-Wilk normality test. The result of the normality test of the study data can be seen in Table 2 below. The data in Table 2 show that the Sig. value of the data from the experimental and control groups was higher than the alpha 0.05. From that result, it can be assumed that the data were normally distributed.

TABLE 2
NORMALITY TEST RESULT

Group	Shapiro-Wilk		
	Statistic	df	Sig.
Experimental	.961	24	.465
Control	.982	24	.933

C. Homogeneity Test Result

After confirming the data to be normally distributed, the researchers continued the analysis using a homogeneity test. The researchers used the Levene Statistic to check the homogeneity of the data in this study. As shown in Table 3, the result indicates that the data were not homogenous. It is because the Sig. value was lower than the alpha 0.05.

TABLE 3
HOMOGENEITY TEST RESULT

Levene Statistic	df1	df2	Sig.
6.904	1	46	.012

D. Independent Samples T-Test Results

Even though the data were not homogeneous, since the data were normally distributed, the researcher still analyzed the data using an independent samples t-test. However, the researchers used the “Equal variances not assumed” result to determine the effect of JRELM on students’ English mastery. Based on the independent samples t-test results, as shown in Table 4, the Sig. value for the “Equal variances not assumed” was lower than the alpha 0.05. Therefore, this study found that JRELM affects students’ English mastery.

TABLE 4
INDEPENDENT SAMPLES T-TEST RESULTS

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
English Mastery	Equal variances assumed	5.92	46	.000	11.33	1.92	7.477	15.19
	Equal variances not assumed	5.92	34.61	.000	11.33	1.92	7.44	15.22

E. Effect Size Test Result

To identify the effect size of JRELM on students’ English mastery, the researchers calculated it using Cohen’s d formula. Based on the result of the calculation, it was found that Cohen’s d result was 1.7. According to Cohen (2013), when the score exceeds 0.8, it indicates a large and significant effect. Thus, it can be said that this study found that JRELM has a large and significant effect on students’ English mastery.

$$\begin{aligned}
 \text{Cohen's } d &= (M_2 - M_1) / SD_{\text{pooled}} \\
 &= (17.2083 - 28.5417) / 6.636386 \\
 &= 1.707767.
 \end{aligned}$$

IV. DISCUSSION

This study found that JRELM positively impacts students’ English mastery, especially the English language related to electrical engineering jobs. It gives them a strong foundation for effectively facing the challenges of the electrical engineering workplace. Integrating aspects of English with themes and practical activities in electrical engineering is a very effective way to activate students’ listening, speaking, reading, and writing skills through an authentic learning model. This approach provides students with learning experiences relevant to the real world and helps them develop their English skills in the context of electrical engineering. Implementing this approach can significantly benefit students and help them become better prepared to face challenges in an increasingly globalized world of work. Students will have a more engaging and valuable learning experience as they can connect their English skills with real-world contexts in electrical engineering. Since JRELM was designed based on students’ language needs in the context of electrical engineering, allowing them to have communication competence as one of the requirements for working in the electrical industry.

In the ESP context, learning materials that align with the student's needs potentially improve the student's motivation to learn (Lapele, 2019; Rohimajaya et al., 2021). When the students learn the materials related to their targeted job, they will consider it essential to support their future success (Apriliana & Basikin, 2021). Vocational school students are determined and already have their targeted jobs. They will be interested in studying things to help them reach that targeted job (Gustavsson & Persson Thunqvist, 2019; Saliruddin, 2014). They are willing to study harder for the subjects they believe will help them reach their future jobs. Therefore, they will work hard to master that subject. In other words, learning materials that fit students’ needs will provide the students with extrinsic motivation, the external things that drive someone to do something (Ryan & Deci, 2000). Therefore, that learning material will boost the students’ learning motivation. When the students have good learning motivation, they usually learn better (Kusurkar et al., 2013; Lo et al., 2022).

Besides, JRELM was provided with various media, pictures, videos, and an online quiz. Various media use has proven effective in improving students' English mastery (Long, 2022; Pham & Li, 2022). JRELM provides the students with various media that can be accessed online. Pictures illustrating the topic and things the students learn can help them understand the learning materials (Boerma et al., 2016; Ratminingsih et al., 2022). Using pictures is very helpful for teaching vocabulary because pictures can illustrate the words so that the students can guess the meaning of the words by seeing the pictures (Rosenthal-von der Pütten & Bergmann, 2020). Besides, in learning English as a foreign language, providing pictures as translation is more attractive for the students to study vocabulary than providing word-to-word translation (Liando et al., 2022). In addition, pictures can also help the students with the four language skills: listening, reading, speaking, and writing. In listening and reading, pictures that illustrate the content of the writing or the audio will help the students to understand the text or the audio because the pictures can create context and provide the students with clues about what the text and audio will be about (Abas, 2023; Suryaningtyas, 2011). In speaking and writing, providing students with pictures related to the speaking or writing tasks that they have to create will help them get an idea of what they have to say or write.

Similar things also happen with the use of videos. Interesting videos containing the learning materials that the students have to study can also help them improve their vocabulary and English language skills (Hu et al., 2021). Videos that combine audio and pictures can improve the student's motivation to study. Besides, videos can also bring context so the students can guess the meaning of words or sentences in the videos (Barani et al., 2010). That is why watching English movies has been reported to be able to improve students' English mastery. Thus, some studies recommended that watching movies can be an alternative way to learn English independently.

The other thing that makes JRELM successful in improving students' English mastery is that it is provided with online quizzes, and the materials can be accessed online. An online quiz can be a fun activity for the students, especially the gamified-online quiz (Wang & Tahir, 2020). Besides, it helps the students monitor their learning progress. Online quizzes provide students with instant results and reviews (Zainuddin et al., 2020). The online quiz results make the students aware of their current abilities. If they get a low score, they need to study more, and they can check what part they need to focus on by looking at the review results. The students can identify and study their weaknesses by reading the reviews. Besides, online materials allow students to learn from anywhere and anytime through various gadgets. Nowadays, students can study using their smartphones. Thus, online learning materials will provide flexibility for the students to study (Wang et al., 2023).

V. CONCLUSION

The JRELM for English improves students' learning outcomes and language skills, particularly in electrical engineering. The fact that the average post-test score was higher than the pre-test for students taught using conventional materials suggests that the JRELM for EOP approach has made a meaningful impact on the students' learning. This study has proven the value of integrating JRELM as EOP teaching materials into the learning process for electrical engineering students. The focus on practical skills, industry relevance, and language proficiency seems to have resulted in improved learning outcomes and enhanced language skills. This integrated approach aligns well with preparing students for successful careers in electrical engineering.

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